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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/689,131	10/12/2000	John M. Hetzel, JR.	461568-014	8089

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EXAMINER	
STAICOVICI, STEFAN	

ART UNIT	PAPER NUMBER
1732	

DATE MAILED: 04/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

Office Action Summary	Application No.	Applicant(s)	
	09/689,131	HETZEL,, JOHN M.	
	Examiner	Art Unit	
	Stefan Staicovici	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37,42-57 and 65* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-37, 42-57 and 65* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 October 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 90, 2004 has been entered.

Response to Amendment

2. Applicant's amendment field January 9, 2004 has been entered. Claims 1-2, 17, 20, 23-24, 36 and 42-43 have been amended. Claims 38-41 and 58-64 have been canceled. New claim 65 has been added. Claims 1-37, 42-57 and 65 are pending in the instant application.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 3-4, 8, 11, 17, 21-22, 42, 44-45, 49, 52, 56-57 and 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Medwell (US Patent No. 4,656,674) in view of JP 64-68572.

Medwell ('674) teaches the basic claimed process of forming a protective helmet including, providing a thermosetting resin pre-impregnated fabric (fiber-based filler), positioning said thermosetting resin impregnated fabric into a mold having a male and a female mold half and molding said thermosetting resin impregnated fabric into a protective helmet under heat and pressure by curing said thermosetting resin (see col. 2, line 65 through col. 3, line 14). Since the fabric is pre-impregnated it is submitted that curing occurs after resin impregnation.

Regarding claims 1, 17 and 42, Medwell ('674) do not teach a thermosetting resin impregnated fabric having ceramic particles mixed therein. JP 64-68572 teaches a process for improving the heat reflectivity of a resin impregnated fabric including, mixing 0.1-50% by weight ceramic particles, having a size of less than 20 microns, with a thermosetting resin and, impregnating a fibrous sheet with said polymer resin/ceramic particle mixture (see Abstract). Therefore, it would have been obvious for one of ordinary skill in the art to have mixed 0.1-50% by weight ceramic particles of less than 20 microns as taught by JP 64-68572 with the thermosetting resin in the process of Medwell ('674) because, JP 64-68572 specifically teach that ceramic particles radiate far-infrared rays, hence teaching increased protection from external infrared radiation, hence improving the protective characteristics of the resulting molded helmet and also because, both references teach a resin impregnated fabric.

In regard to claims 8 and 49, Medwell ('674) teaches a polyester thermosetting resin (see col. 3, lines 9-14).

Specifically regarding claims 11 and 52, Medwell ('674) teaches polyaramid fibers (see col. 3, lines 5-9).

Regarding claims 56-57, it is submitted that after curing, said thermosetting resin is rigid. Further, it is submitted that the protective helmet Medwell ('674) meets the NFP Standards in order to function as described.

In regard to claim 65, Medwell ('674) teaches that the fabric is pre-impregnated with either a polyester or a phenolic thermosetting resin before cutting, hence before curing (see col. 1, lines 32-35). It is submitted that a fabric prepreg impregnated with a polyester resin or phenolic resin is impregnated with a liquid resin because said polyester and phenolic resins are liquid.

Specifically regarding claims 3-4, 21-22 and 44-45, JP 64-68572 teaches a mixture including, a thermosetting resin and 0.1-50% by weight ceramic particles having a size of less than 20 microns (see Abstract). Therefore, it would have been obvious for one of ordinary skill in the art to have mixed 0.1-50% by weight ceramic particles of less than 20 microns as taught by JP 64-68572 with the thermosetting resin in the process of Medwell ('674) because, JP 64-68572 specifically teach that ceramic particles radiate far-infrared rays, hence teaching increased protection from external infrared radiation, hence improving the protective characteristics of the resulting molded helmet and also because, both references teach a resin impregnated fabric.

5. Claims 9-10 and 50-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over unpatentable over Medwell (US Patent No. 4,656,674) in view of JP 64-68572 and in further view of Hetzel, Jr. *et al.* (US Patent No. 6,098,197).

Medwell ('674) in view of JP 64-68572 teach the basic claimed process as described above.

Regarding claims 9 and 50, Medwell ('674) in view of JP 64-68572 do not teach a vinyl ester thermosetting resin. Hetzel, Jr. *et al.* ('197) a process for making a protective helmet including, providing a male (26) and a female (28) mold, positioning a fiber reinforced sheet (16) in said female mold (28), pouring a thermosetting resin (18) onto said fiber reinforced sheet (16), closing said male mold onto said female mold and curing under heat and pressure said resin to form a protective helmet (see col. 6, lines 41-60 and Figure 6). Further, Hetzel, Jr. *et al.* ('197) teaches that polyester and vinyl ester are equivalent alternatives for molding a protective helmet (see col. 3, lines 9-14). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a vinyl ester thermosetting resin as taught by Hetzel, Jr. *et al.* ('197) in the process of Medwell ('674) in view of JP 64-68572, because Hetzel, Jr. *et al.* ('197) specifically teach that polyester and vinyl ester thermosetting resins are equivalent alternatives for molding a protective helmet.

In regard to claims 10 and 51, Hetzel, Jr. *et al.* ('197) teach that a vinyl ester thermosetting resin includes a catalyst, hence it is submitted that said catalyst was applied prior to impregnating said fibrous sheet with said thermosetting resin (see col. 6, lines 44-46). Therefore, it would have been obvious for one of ordinary skill in the art to have added a catalyst vinyl ester to a thermosetting resin as taught by Hetzel, Jr. *et al.* ('197) in the process of Medwell ('674) in view of JP 64-68572, because Hetzel, Jr. *et al.* ('197) specifically teach that

polyester and vinyl ester thermosetting resins are equivalent alternatives for molding a protective helmet.

6. Claims 12-13, 15 and 53-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Medwell (US Patent No. 4,656,674) in view of JP 64-68572 and in further view of Hastings (US Patent No. 5,794,271).

Medwell ('674) in view of JP 64-68572 teach the basic claimed process as described above.

Regarding claims 12-13, 15 and 53-55, although Medwell ('674) teaches providing additional reinforcement layers (see col. 2, lines 60-65), Medwell ('674) in view of JP 64-68572 does not specifically teach a fiber-based sheeting, especially a woven/non-woven glass fiber sheeting. Hastings ('271) teaches a polymeric protective helmet including, providing a non-woven glass fiber layer (32) (see col. 3, lines 6-20 and Figure 3). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a fiber-based sheeting, especially a non-woven glass fiber sheeting as taught by Hastings ('271) in the protective helmet formed by the process of Medwell ('674) in view of JP 64-68572 because, Hastings ('271) specifically teaches that such a sheeting provides for improved impact resistance, and also because Medwell ('674) and Hastings ('271) teach similar end-products.

7. Claims 1, 3-5, 8, 11-13, 15-19, 21-23, 27, 33-36, 42, 44-46, 49, 52-57 and 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hastings (US Patent No. 5,794,271) in view of JP 64-68572.

Hastings ('271) teaches the basic claimed process of forming a protective helmet including providing a first layer of thermosetting resin (18) on a mold surface, placing a second layer including a fiber reinforced woven fabric (20) over said first layer of thermosetting resin (18), spreading a third layer of said thermosetting resin (22) onto said fiber reinforced woven fabric layer (20) and molding (curing thermosetting resin) said layers to form said protective helmet (see col. 2, lines 38-65). It is submitted that because Hastings ('271) teaches a molding process, that a female and a male mold are taught in order to obtain a molded article as shown in Figure 1. Further, it is submitted that because the third layer of said thermosetting resin (22) is being *spread* (emphasis added) prior to hardening (see col. 1, lines 39-45), then it is in a fluid state and as such impregnation of said fiber reinforced woven fabric layer (20) by said third layer of said thermosetting resin (22) begins to occur prior to curing because said thermosetting resin (22) is in a fluid (liquid) state.

Regarding claims 1, 17, 23, 36 and 42, Hastings ('271) does not teach a thermosetting resin impregnated fabric having ceramic particles mixed therein. JP 64-68572 teaches a process for improving the heat reflectivity of a resin impregnated fabric including, mixing 0.1-50% by weight ceramic particles, having a size of less than 20 microns, with a thermosetting resin and, impregnating a fibrous sheet with said polymer resin/ceramic particle mixture (see Abstract). Therefore, it would have been obvious for one of ordinary skill in the art to have mixed 0.1-50% by weight ceramic particles of less than 20 microns as taught by JP 64-68572 with the thermosetting resin in the process of Hastings ('271) because, JP 64-68572 specifically teach that ceramic particles radiate far-infrared rays, hence teaching increased protection from external

infrared radiation, hence improving the protective characteristics of the resulting molded helmet and also because, both references teach a resin impregnated fabric.

Further regarding claims 18-19, 23 and 36, it should be noted that Hastings ('271) teaches a first thermosetting resin layer (18), a fiber layer (20) and a second thermosetting layer (22) placed onto said fiber layer (20).

In regard to claims 5, 27 and 46, Hastings ('271) teaches that the epoxy layer penetrates second layer (20) to completely saturate said second layer (20) (see col. 2, line 66 through col. 3, line 5). Further, upon curing, it is submitted that "complete saturation" requires that the epoxy resin flow around the fibers and bond to the fibers during the curing process.

In regard to claims 8 and 49, Hastings ('271) teaches an epoxy thermosetting resin (see col. 2, lines 41-42).

Specifically regarding claims 11 and 52, Hastings ('271) teaches aramid fibers (see col. 2, lines 50-51).

Regarding claims 12-13, 15, 33-35 and 53-55, Hastings ('271) teaches a polymeric protective helmet having a non-woven glass fiber layer (32) bonded to woven fiber layer (20) (see col. 3, lines 6-20 and Figure 3).

In regard to claim 16, Hastings ('271) teaches placing a fiber layer (20) onto a first resin layer (18) and then placing a second resin layer (22) onto said fiber layer (20). Hence, it is submitted that said fiber layer (20) is positioned in the mold prior to resin impregnation.

Regarding claims 56-57, it is submitted that after curing, said thermosetting resin is rigid. Further, it is submitted that the protective helmet of Hastings ('271) meets the NFP Standards in order to function as described.

In regard to claim 65 and in further regard to claim 23, it is submitted that because the third layer of said thermosetting resin (22) is being *spread* (emphasis added) prior to hardening (see col. 1, lines 39-45), then it is in a fluid state and as such impregnation of said fiber reinforced woven fabric layer (20) by said third layer of said thermosetting resin (22) begins to occur prior to curing because said thermosetting resin (22) is in a fluid (liquid) state.

Specifically regarding claims 3-4, 21-22 and 44-45, JP 64-68572 teaches a mixture including, a thermosetting resin and 0.1-50% by weight ceramic particles having a size of less than 20 microns (see Abstract). Therefore, it would have been obvious for one of ordinary skill in the art to have mixed 0.1-50% by weight ceramic particles of less than 20 microns as taught by JP 64-68572 with the thermosetting resin in the process of Hastings ('271) because, JP 64-68572 specifically teach that ceramic particles radiate far-infrared rays, hence teaching increased protection from external infrared radiation, hence improving the protective characteristics of the resulting molded helmet and also because, both references teach a resin impregnated fabric.

8. Claims 2, 20, 24, 37 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hastings (US Patent No. 5,794,271) in view of JP 64-68572 and in further view of JP 55-3320.

Hastings ('271) in view of JP 64-68572 teaches the basic claimed process as described above.

Regarding claims 2, 20, 24, 37 and 43, Hastings ('271) in view of JP 64-68572 do not teach chopping the ceramic particles. JP 55-3320 teaches forming ceramic particles by grinding (chopping) a ceramic blank. Therefore, it would have been obvious for one of ordinary skill in the art to have formed ceramic particles by grinding (chopping) a blank as taught by JP 55-3320 in the process of JP 64-68572 because, JP 55-3320 specifically teaches forming ceramic particles by grinding, whereas JP 64-68572 teaches a process for impregnating a fabric with a mixture containing ceramic particles and thermosetting resin. Further, it should be noted that JP 64-68572 specifically teaches a process for improving the heat reflectivity of a resin impregnated fabric including, mixing 0.1-50% by weight ceramic particles, having a size of less than 20 microns, with a thermosetting resin and, impregnating a fibrous sheet with said polymer resin/ceramic particle mixture (see Abstract).

In regard to claims 25 and 26, JP 64-68572 teaches a mixture including, a thermosetting resin and 0.1-50% by weight ceramic particles having a size of less than 20 microns (see Abstract). Therefore, it would have been obvious for one of ordinary skill in the art to have mixed 0.1-50% by weight ceramic particles of less than 20 microns as taught by JP 64-68572 with the thermosetting resin in the process of Hastings ('271) in view of JP 55-3320 because, JP 64-68572 specifically teach that ceramic particles radiate far-infrared rays, hence teaching increased protection from external infrared radiation, hence improving the protective characteristics of the resulting molded helmet and also because, both references teach a resin impregnated fabric.

9. Claims 6-7, 9-10, 14, 28-32, 47-48, 50-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hastings (US Patent No. 5,794,271) in view of JP 64-68572 and in further view of Hetzel, Jr. *et al.* (US Patent No. 6,098,197).

Hastings ('271) in view of JP 64-68572 teaches the basic claimed process as described above.

Regarding claims 9, 31 and 50, Hastings ('271) in view of JP 64-68572 do not teach a vinyl ester thermosetting resin. Hetzel, Jr. *et al.* ('197) a process for making a protective helmet including, providing a male (26) and a female (28) mold, positioning a fiber reinforced sheet (16) in said female mold (28), pouring a thermosetting resin (18) onto said fiber reinforced sheet (16), closing said male mold onto said female mold and curing under heat and pressure said resin to form a protective helmet (see col. 6, lines 41-60 and Figure 6). Further, Hetzel, Jr. *et al.* ('197) teach that polyester and vinyl ester are equivalent alternatives for molding a protective helmet (see col. 3, lines 9-14). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a vinyl ester thermosetting resin as taught by Hetzel, Jr. *et al.* ('197) in the process of Hastings ('271) in view of JP 64-68572, because Hetzel, Jr. *et al.* ('197) specifically teach that polyester and vinyl ester thermosetting resins are equivalent alternatives for molding a protective helmet.

In regard to claims 10, 30, 32 and 51, Hetzel, Jr. *et al.* ('197) teach that a vinyl ester thermosetting resin includes a catalyst, hence it is submitted that said catalyst was applied prior to impregnating said fibrous sheet with said thermosetting resin (see col. 6, lines 44-46). Therefore, it would have been obvious for one of ordinary skill in the art to have added a catalyst

vinyl ester to a thermosetting resin as taught by Hetzel, Jr. *et al.* ('197) in the process of Hastings ('271) in view of JP 64-68572, because Hetzel, Jr. *et al.* ('197) specifically teach that polyester and vinyl ester thermosetting resins are equivalent alternatives for molding a protective helmet. Further regarding claim 30, it should be noted that Hastings ('271) teaches an epoxy thermosetting resin (see col. 2, lines 41-42). It should be noted that in claim 32, it is submitted that the catalyst is mixed with the thermosetting resin prior to being molded in order to allow homogeneous distribution of said catalyst within said thermosetting resin and as such to function as described by Hetzel, Jr. *et al.* ('197).

Specifically regarding claim 14, Hetzel, Jr. *et al.* ('197) teach a firefighter helmet having a thickness of 0.08 inches (approximately 0.09 inches) (col. 5, line 37). It would have been obvious for one of ordinary skill to have provided a fibrous layer having a thickness of approximately 0.09 inches (0.08 inches) as taught by Hetzel, Jr. *et al.* ('197) in the process of Hastings ('271) in view of JP 64-68572, because Hetzel, Jr. *et al.* ('197) specifically teach that such a thickness is desirable for a protective helmet, which is taught by Hastings ('271).

Regarding claims 6-7, 28-29, 47-48, it is submitted that molding time, temperature and pressure are result-effective variables. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Further, it should be noted that Hetzel, Jr. *et al.* ('197) teach a molding temperature of 100 to 200 ^{o}F, a molding pressure of 300 to 500 psi and a molding time of 6-9 minutes (see col. 6, lines 57-68). Therefore, it would have been obvious for one of ordinary skill in the art to have determined an optimum molding temperature, pressure and time as taught by Hetzel, Jr. *et al.* ('197) in the process of Hastings ('271) in view of JP 64-68572 because, Hetzel, Jr. *et al.* ('197)

teach molding (curing) conditions for an epoxy thermosetting resin, which is the material, taught by Hastings ('271) and as such both references teach compression molding of epoxy thermosetting impregnated fabric.

Response to Arguments

10. Applicant's remarks filed January 9, 2004 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stefan Staicovici, Ph.D. whose telephone number is (571) 272-1208. The examiner can normally be reached on Monday-Friday 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael P. Colaianni, can be reached on (571) 272-1196. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Stefan Staicovici, PhD

Primary Examiner 4/1/04

AU 1732

April 1, 2004